Experimental Heat Capacity Under Pressure and Viscosity of a Eutectic Mixture for Solar Thermal Energy Storage Application

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In the last year, the worldwide energy consumption based in the fossil fuels oil, coal, and gas represented about 81% whereas the renewable energies reached only 16%. Significant deviations from these values can occur for specific countries [1]. In European Union, renewables accounted for 20% of the total electricity generation with almost half of it to non-hydropower [2]. The storage of the energy generated in renewable systems is a critical factor in the advancement of solar technologies [3]. New technologies are currently being developed to enhance capabilities and reduce the cost of the next-generation of concentrating solar power (CSP) plants. Among others, developments focus on improved of thermal storage looking for heat transfer fluid with low melting point, high thermal stability and high heat capacity. Nanofluids, in which nanosized particles are suspended in liquids, have emerged as a potential candidate for the tailoring and production of heat transfer fluids [4]. The accurate knowledge of the thermophysical properties of current heat transfer or thermal energy storage fluids is the previous step to obtain enhanced performances in new advanced thermal technology. Thus, in this study we present experimental isobaric heat capacities, C_p, and viscosities, h, of the eutectic mixture of diphenyl ether and biphenyl.

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